

Abstract

Today, people use interactive systems to accomplish many of their professional and personal goals. The use of interactive products has become an integral part of our everyday lives. In response, interactive system development does not exclusively focus on design of useful and usable products anymore, but takes the entire user experience into account to be successful. **But what determines a good user experience?** To answer this question, an approach to user experience of interaction with technical systems is presented that makes theoretical, methodological, and empirical contributions to overcome shortcomings of existing approaches and gives recommendations to incorporate user experience design goals already in early stages of the development process of interactive systems.

A user experience framework introduces instrumental and non-instrumental quality perceptions as well as emotional user reactions as central components of user experience. Perceived usefulness and usability are discussed as aspects of the instrumental quality of interactive systems. A hierarchical approach to non-instrumental quality perceptions takes into account three categories: aesthetic, symbolic, and motivational aspects. A multi-component approach to emotional user reactions is proposed that defines five aspects of emotions: subjective feelings, physiological reactions, motor expressions, cognitive appraisals, and behavioral tendencies. Interactive system properties, user characteristics, and context parameters are discussed as main influencing factors of user experience, and overall judgments, choices between alternatives, and usage behavior are taken into account as consequences of user experience. Interrelations between the factors of the framework are discussed in detail and form the basis for empirical research questions.

The assessment of non-instrumental quality perceptions and emotional user reactions is focused in the methodological section. Toolboxes of methods are proposed for these two user experience components, which are applied in the empirical part. In summary, the results of three studies on portable audio players support most of the assumptions made in the user experience framework. All three categories of influencing factors have a significant impact on user experience. While system properties have a direct effect on instrumental and non-instrumental quality perceptions, user characteristics and context parameters affect the interrelations of the user experience components and their impact on consequences of user experience. With respect to interrelations of the user experience components, the results support the assumptions that (1) instrumental and non-instrumental qualities are perceived independently, (2) emotional user reactions are determined by instrumental and non-instrumental quality perceptions, and (3) consequences of user experience are influenced by all three components of user experience.

In conclusion, the theoretical, methodological, and empirical results are summarized in suggestions to add user experience design goals during the development process of interactive systems. Recommendations are formulated for analysis, design generation, and evaluation activities.